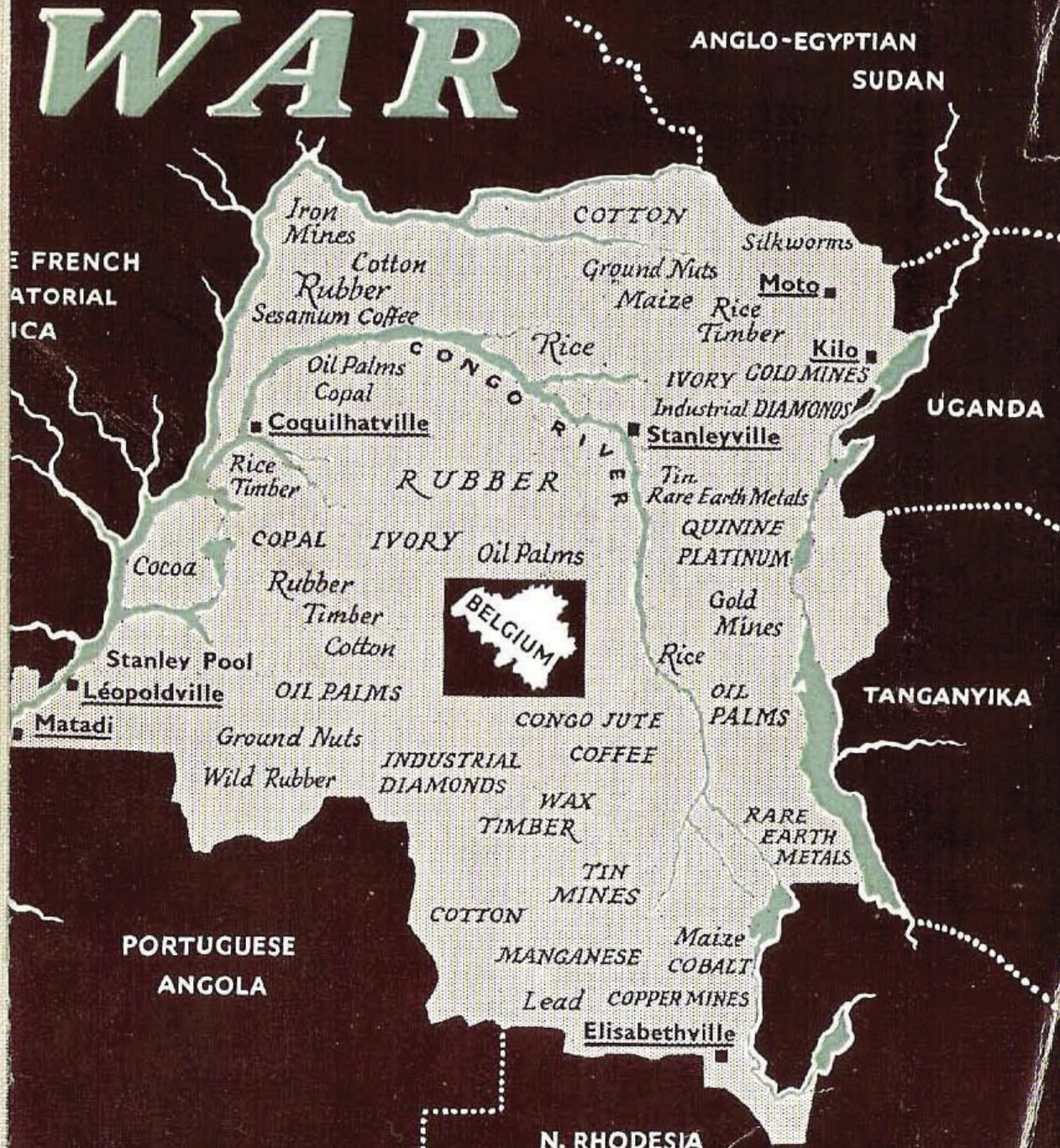
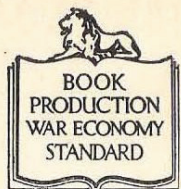


BELGIAN AFRICA'S TOTAL WAR



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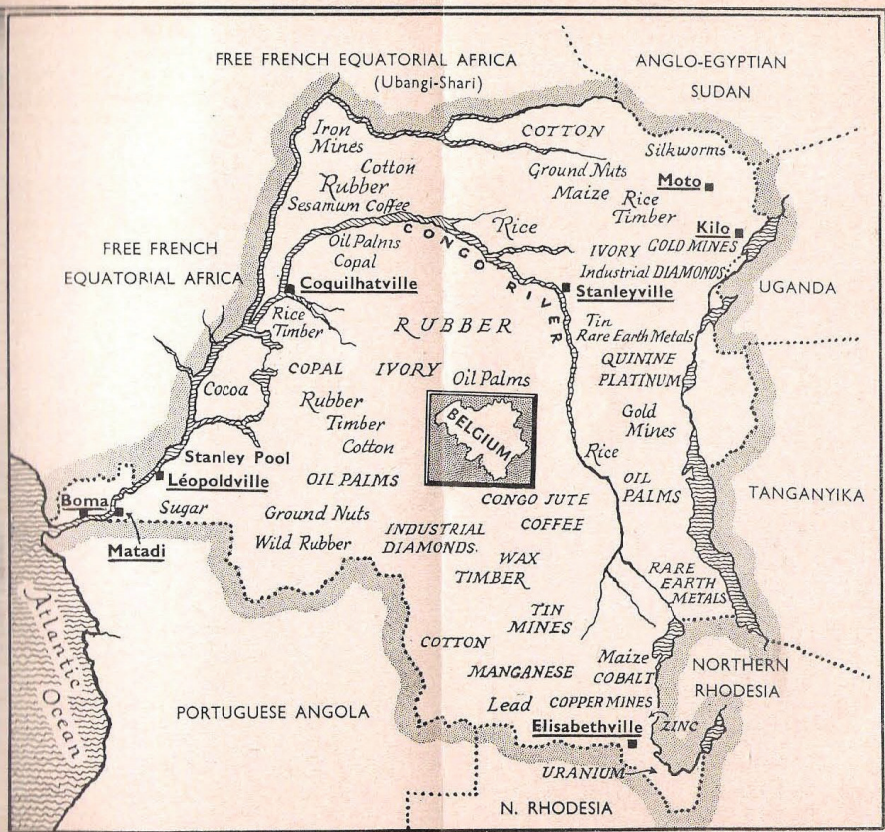


THE TYPOGRAPHY AND BINDING
OF THIS BOOK CONFORMS TO THE
AUTHORIZED ECONOMY STANDARDS

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THE WEALTH OF CENTRAL AFRICA, CONTROLLED BY THE BELGIAN GOVERNMENT IN LONDON



The Belgian Congo, showing chief resources. Inset: Belgium on the same scale.

BELGIAN AFRICA'S TOTAL WAR

by
WALTER FORD
II

with a Foreword by
THE RT. HON. THE VISCOUNT CRANBORNE
Lord Privy Seal, lately Secretary of State
for the Colonies

CARNEGIE ENDOWMENT
FOR
INTERNATIONAL PEACE
15 1943
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FOREWORD

THE story of the contribution of the peoples of the Colonial Empire of Belgium in the time of her most grievous adversity is not only a refutation of those who, in ignorance of the facts, or even in spite of them, assert that there is something inferior about colonial status. It is an inspiration to those nations who, like ourselves, should be more properly described as blessed with the privilege of colonial responsibilities.

Nothing has been more remarkable in the present World War than the unbroken record of fidelity of the various colonies of the Allied Nations to their mother-countries. It must, indeed, have been a sad disappointment to the dictators to find that the further their plans of aggression appeared to be proceeding on the road of success, the more resolute did the colonies of the free nations of Europe now temporarily under their heel become in the support of their oppressed mother-countries.

The Colonial Empires of the 20th century are as far in advance of those of the 19th as were those of the 19th in front of the Colonial Empires of the 18th and earlier centuries. Rule by conquest for exploitation has long since ceased to be traceable in 20th century colonial enterprise. To-day the freedom loving peoples of the colonies of the free and Allied Nations are fighting Hitler and Hitlerism because they know that their own liberties depend upon the survival of the liberties of their mother-countries. They are our partners in a struggle for freedom of which the colonial link is a guarantee and an assurance, and their unswerving loyalty is the proof that they are fully conscious of this essential fact.

Our Belgian friends and allies have something to tell the world in which they may well feel a legitimate pride.

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Belgian Africa has not been called upon to endure, and we hope it will never be called upon to endure the miseries of foreign occupation. But it is making, as this most interesting and valuable book shows, a vital contribution to the final victory. It has become one of the storehouses and arsenals of democracy. From the copper, tin and many other raw materials of the Congo, are being forged the weapons for the liberation of the Mother Country and all other oppressed peoples; her foodstuffs are helping to sustain the United Nations in their hour of trial; they will pour out in a great mass to feed Europe when Europe is free again. The armed forces of the Congo stand shoulder to shoulder with their allies. Long live Belgium and the Belgian Congo!

CRANBORNE.

ECONOMIC EFFORT

WEALTH OF THE CONGO CONTROLLED FROM LONDON

THOUGH the whole of Belgium is at present in the hands of the enemy, the Belgian Government in London still commands all the wealth of a region eighty times more extensive than the mother-country, comprising a twelfth of the African continent.

The Belgian Congo, rich in mines, forests, plantations, and animal life, exported goods to the value of 2,487 million francs (£17 million) in 1937, 1,897 million (£13 million) in 1938, and 1,732 million (again £13 million at the higher rate of exchange then ruling) in 1939.

The vast resources of this area have been placed unreservedly at the disposal of the Allied war effort. Everything is being done to raise the output of strategic materials, and with great success, as will be described in detail later. In particular the production of tin, cotton, and industrial diamonds rises continually.

Unique Difficulties Surmounted

The ingenuity expended and the immense difficulties overcome to achieve this are not easily realised.

The old familiar problems that confronted European and American countries under the impact of war struck at the Congo too, but there they came in a fantastically enhanced form, luxuriating as it were in that tropic zone like the English rabbit nuisance suddenly became a vast menace under the Australian sun.

England had to reduce imports of luxuries and non-essentials gradually, in order to save shipping space and foreign currency; but about *half of the Congo's imports* were cut off at one stroke in the overwhelming days of the 10th to

28th May, 1940. Exporters in England had to adjust themselves to the loss of valuable markets in Germany at first, and then successively in one country and another ; but with the fall of Belgium, *three-quarters of the Congo's markets* were suddenly gone. In those eighteen days, many a great Congo enterprise lost in fact the whole of its markets, directorate, reserves, and much more. Companies were, so to speak, decapitated, for in some cases the Brussels office of a great colonial company would settle general policy, arrange purchases of plant, machinery, equipment and supplies, finance them, and be entirely responsible for finding customers. The management in the Congo would simply produce as efficiently as possible up to capacity, or to a limit dictated by market fluctuations or marketing agreements, and ship the product to the parent company in Belgium, who did the rest.

The recovery from such handicaps has been truly remarkable.

WHOLE-HEARTED CO-OPERATION IN ALLIED WAR EFFORT

The whole-hearted and ungrudging spirit in which the full resources of the Congo have been harnessed to the Allied war machine was made plain in a speech by the Governor-General, Monsieur Ryckmans, at the opening of the Government Council on 4th February, 1941, in which he admitted that certain private interests had been disappointed in the Anglo-Belgian Finance and Purchase Agreements of that year. Some were even frankly asking, he said, whether the Belgian negotiators concerned were less able than others, or whether Great Britain were not generously disposed towards Belgium.

"I want to make this quite clear," said Monsieur Ryckmans. "Great Britain refused us nothing, either in the economic or the financial field. If we gained no greater

benefit, it was because we asked none. If we asked none, it was because we were not there to sell out at the top price like mercenaries, but to pool all our resources like good Allies."

Great Britain, the Governor-General went on, had thrown all her wealth into the struggle, and was offering up the blood of her sons, not only in self-defence, but also to liberate smaller nations. What the Belgian colonies could give would be given without haggling, and nothing would be asked in return—nothing, that is, but victory and freedom!

The Congo had no need of subsidies, and had only asked for definite arrangements that would enable the country to plan its economy, for known markets that would allow of sound budgeting. How could they best aid the Alliance? What goods did England most urgently need? These should have priority. For the rest, as soon as they knew what other goods Great Britain could buy from them, taking into consideration her needs, the available shipping space, and the allotment of purchases between her own Colonies and Allied ones, they would organise production accordingly.

Great Britain's needs would come first. As to the goods of which Britain had no need, she would not be asked to accept them. Other markets would be sought, production or sales would be restricted, or facilities would be given for storing non-perishable goods. In extreme cases, subsidies would be granted from the public funds.

TWO PHASES OF ANGLO-BELGIAN ECONOMIC CO-OPERATION

Such is the policy followed by the Belgian Government with regard to vital war supplies from the Congo, and embodied in four Agreements with the British Government.

Two phases may be distinguished in the practical working of this policy.

In the first phase:

(a) There are still powerful neutrals in the world whose currency must be kept at a reasonable level in relation to sterling;

(b) Britain still has plentiful supplies of tin, rubber, oil-seeds, and tungsten ore from the East;

(c) Consequently gold is the most important contribution the Congo can make to Allied resources. Production of gold is pushed to the limit at the expense of all other work, and the metal is deposited in Capetown, boxed ready for shipment to the United States or elsewhere;

(d) Congo rubber and tin, not being essential to Great Britain as strategic materials at this stage, are also sent to America to procure dollars;

(e) Most other Congo products are required only in quantities well within normal output, and some are not called for at all.

In the second phase, with the entry of Japan, the United States, and a number of smaller countries into the war, the world is near to being entirely divided up between Allies and enemies, and the problem of supporting Allied currency in relation to neutral tends to disappear. Cash-and-carry gives way to Lease-lend. Gold, from being the king of commodities, suddenly seems almost a drug on the market, and even respectable economists like Mr. Oscar Hobson incline towards the heretical opinion (formerly reserved for Bolsheviks, Fabians, Major Douglas, Professor Soddy and other strangely-assorted company) that gold is a fetish, that it is illogical to produce it at all in time of war, and even that it may never be of any use again except for jewellery and works of art.

This in itself tends to make gold production take second place after base metals used in war. When the surrender or swift fall of French Indo-China, Thailand, British Malaya, the Dutch East Indies and Burma follows, new sources of

tin, rubber and tungsten become an urgent need. Production of these materials is driven to the limit, they have prior claim on men and equipment, and gold definitely drops into the background.

These two phases correspond roughly to the two pairs of Anglo-Belgian agreements signed since the invasion of Belgium.

THE FIRST ANGLO-BELGIAN WAR AGREEMENTS

A Financial and a Purchase Agreement were signed by the Belgian and British Governments on 21st January, 1941.

Under the Financial Agreement, which is to last for the duration of the war unless the Purchase Agreements lapse meanwhile, the rate of exchange for Congolese francs was fixed, and the Congo became part of the Sterling Area. This is the zone within which the Treasury allows remittances, transfer of bills of exchange, sale of non-controlled securities and various other transactions without special licence.

The Belgian Government on their part undertook to safeguard the linked currencies by forbidding unnecessary imports into the Congo, preventing speculation in foreign exchange, and selling the whole gold production (after providing for their own official needs) to Great Britain at current London prices.

Under the Purchase Agreement, the United Kingdom agreed to import for official or private account all the high-quality palm oil (not over 6 per cent. of free fatty acid content) that the Congo could produce, and not less than:

124,000	English tons of copper
20,000	" " " cotton
7,000	" " " copal
2,500	" " " ground-nuts (peanuts)
15,000	" " " palm kernels

during the twelve months ending 31st August, 1941.

Tin ore was sufficiently covered by existing private contracts, and the British Government promised to consider the possibility of maintaining them at the same level on expiry. The Congo was also to be considered as a source of sugar supplies.

Prices and Purchase Conditions

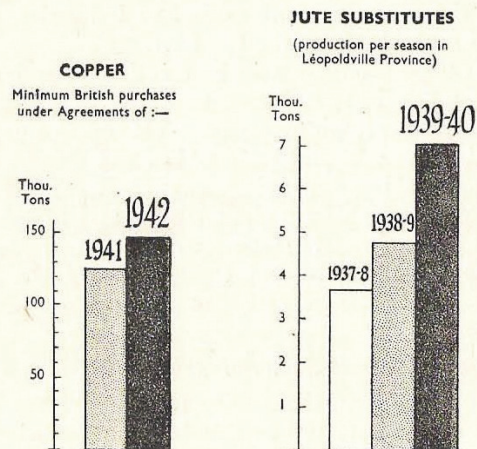
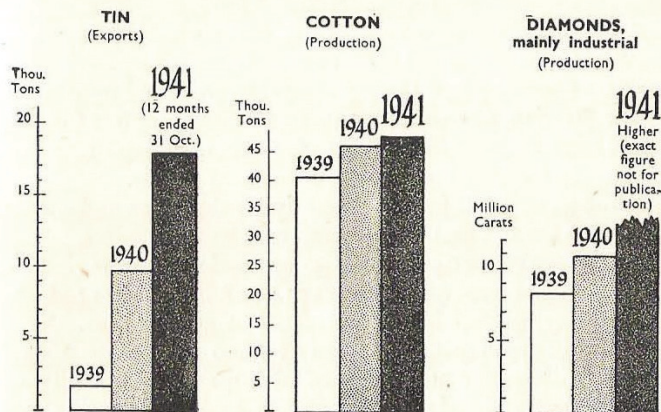
The price of palm oil was fixed at £12 per long ton, inclusive of cost and freight to English port, which compares with prices ruling for Nigerian oil at the time when the agreement was negotiated. There was, however, "an unexpected steep rise in market prices shortly after.

All other prices were left to the free play of the market, with the sole and very reasonable proviso that Congo copper should fetch the same price as Rhodesian, and Congo palm kernels the same as Nigerian, subject to adjustment for any difference in quality.

With the submarine onslaught on our sea routes at its height, it was uncertain whether the agreed quantities could be shipped within the stated time. So that the finances of the producing companies, weakened in some cases by severance from the parent company in Belgium, should not be at the mercy of the tides of war, the British Government agreed to pay for any balances remaining unshipped after certain dates, taking over ownership of them where they lay in the Congo. Without some such solid basis to work upon, production might have risked serious disorganisation.

It was further agreed that the goods purchased under the Agreement, and any others bought from the Belgian Congo by the British Government, should enjoy British Empire preferential rates of customs duty. This was a recognition that the Belgian colonists, who had thrown their whole strength and resources into the common struggle against Fascism as readily and unquestioningly as the British, had thereby earned the same standing and privileges.

THE MOUNTING TIDE OF CONGO SUPPLIES



PURCHASE AGREEMENT OF JUNE 1942: GROWING IMPORTANCE OF CONGO SUPPLIES

A further Purchase Agreement was signed by the two Governments on 4th June, 1942. When compared with the first agreements, it clearly shows the growing importance of the Belgian Congo as a source of vital supplies for the Allies after Indo-China, Thailand, Burma, Malaya and the Dutch East Indies had fallen into enemy hands.

Rubber, wolfram (or tungsten), jute substitutes and coffee appeared for the first time in the new arrangements.

Minimum copper purchases to be made over a period of twelve months were raised from 124,000 long tons to 144,000, and cotton was up by 50 per cent. at 30,000 tons. The quantity of copal gum remained at 7,000 tons.

In addition to 25,000 tons of high-quality palm oil for food uses, the Belgian Government took first option on 10,000 tons of lower-grade oil, if available. This quality is used in the glycerine and explosives industries, and was imported normally from the Far East.

Many Congo products were by this time in such demand that Great Britain agreed to take whatever quantities the colony could spare, without limit. This applies to ground-nuts, which came in part from China and Burma, and are needed for making margarine, soap, and cattle foods; to palm kernels, which have similar uses; and to rubber, tin ore, and wolfram. The latter, which came mainly from Burma, Malaya, China and Hong Kong, is an essential ingredient of self-hardening high-speed tool steels.

The Congo needs Tools . . . and Trinkets

At the same time, the steady increase in the flow of materials from the Congo to Britain's war factories cannot be kept up without supplies of tools, machinery and spares in the opposite direction. This is recognised in an important

Note appended to the Agreement, in which Mr. Eden assures the Belgian Foreign Minister, Monsieur Spaak, that everything possible will be done to meet the Congo's needs of "equipment and other supplies essential to the maintenance and increase of production".

The official phrase "other supplies" and so forth covers the odd fact that it will be necessary to make and send to the Congo such unexpected wartime cargoes as bright celluloid necklaces, flowered cotton prints, and cheap sewing-machines. These are not a wanton waste of labour and shipping space; on the contrary, they are literally essential goods without which the Congolese could never be persuaded to produce precious copper, tin, tungsten, and palm oil for British factories. There is only a small number of whites in the Congo. Nearly all manual labour in that tropical climate is necessarily done by negroes, who, in their native surroundings, will certainly not work for a Kingsley-Wood post-war credit, or even for cash if there are no bright ornaments, sugary foods and other treasures to buy with it.

Import Duties and Prices under the Second Agreement

The price of Congo palm oil was brought into line with Nigerian prices, in accordance with the intention of the original agreement. Otherwise the various clauses covering manner of payment, prices, and import duties are unchanged, the Belgian Government being content to ensure that their colonists are granted equality of treatment with British Empire countries in return for their equal efforts and sacrifices.

MILITARY EFFORT

MILITARY AGREEMENT

THE fourth Anglo-Belgian pact of this war, signed on the same day as the second Purchase Agreement, was a military one which relates to the Belgian troops in England rather than in the Congo. These forces, incidentally, are equipped and maintained entirely at the Belgian Government's own expense.

THE BELGIAN CAMPAIGN IN ABYSSINIA

The Belgian forces in Africa have, however, already played their part in the liberation of Abyssinia from Italian rule. The campaign was a classical one for strategical surprise, endurance, and tactical skill.

The Italian armies in East Africa, engaging the British in the north and south, at least thought themselves safe on the west, where their short-lived empire was bounded by desert wastes, a great lake, and perilous mountain tracks.

The Belgian troops nevertheless made the 2,000-mile journey across Central Africa from Léopoldville, braving tropical disease and every hardship to take the enemy by surprise at Saïo. Units of the small Congo "Force Publique", an armed constabulary rather than an army, augmented and equipped with automatic arms and modern artillery, were transported in heavy barges 1,000 miles up the Congo from Stanley Pool, near Léopoldville, to Aketi. Thence the boats were carried by train and lorry another 800 miles to Juba, on the borders of Abyssinia and the Sudan, where they were again launched on the waters of the White Nile.

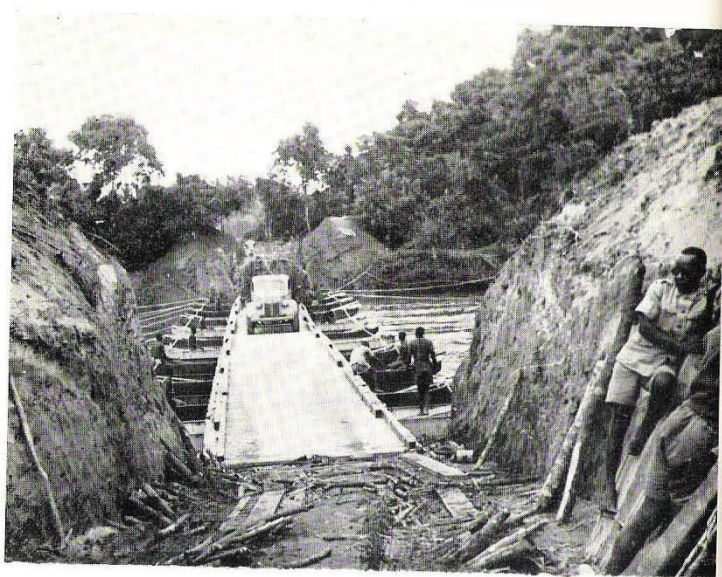
By bold attacks, risky patrols in force, and skilful ruses in the placing and use of artillery, the Italian garrison were



The Governor-General, M. Ryckmans, visits a Congo Army unit.

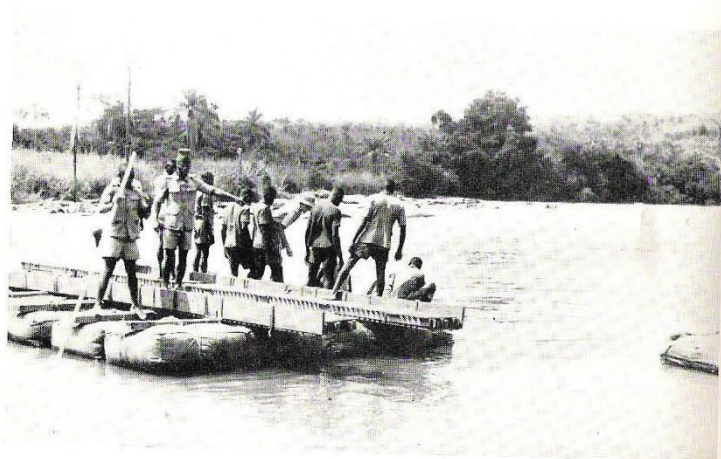


One of the forty-eight Spitfires given to the R.A.F. by Belgian Congo subscribers and manned by Belgian pilots.



Congo native troops practise river crossings : a pontoon bridge.

(Below) An improvised raft.



given the impression of facing a much superior force. The mountain fortress of Saïo was cut off from supplies by a flanking movement, brought about unexpectedly along almost impassable tracks. Finally on the 4th July, 1941, the commander of the fortress, General Gazzera, with eight other Italian generals and over six thousand officers and men, surrendered to General Gilliaert.

Other Congo units had started out from Watsa, in the north-east of the colony, and joined the King's African Rifles, side by side with whom they stormed and took Asosa.

In all 15,000 Italian and colonial prisoners were taken by Congo forces numbering scarcely a third of that figure.

WELL-EQUIPPED CONGO FORCE STANDS READY

The Congo forces have not since been called upon for active service, but they are kept in full readiness. If the enemy attempts an African campaign based on Vichy territory, the Force Publique will be available to strike wherever Allied strategy demands. They are well provided with small, powerful American patrol cars, tommy-guns, mortars, and other modern arms.

A handicap in the Abyssinian fighting, as in so many of the earlier Allied campaigns of this war, was a lack of air support. This has now been remedied, and batches of skilled Belgian pilots continue to flow in from the Union of South Africa, where they are trained.

Large-scale manœuvres were held in May last (1942) to keep the force at fighting pitch, and were pronounced very successful by the Command.

FINANCIAL EFFORT

FIGHTER FUNDS AND WAR RELIEF FUND

As in England, so in the Congo, those who are not called upon to take up arms are giving back a generous part of their earnings to war funds.

Up to the end of 1941, the "Fonds Colonial des Œuvres de Guerre" (Colonial War Relief Fund) had reached 26 million francs (£148,000), and the various Fighter Funds over 44 million (£250,000), of which 4 million francs was given by natives.

When we remember that there are scarcely 30,000 whites in the Congo, and that the money income of the Congolese is insignificant, these sums are seen to be remarkable.

At a ceremonial parade held in Léopoldville recently, a cheque for the quarter of a million sterling was handed to the British Consul-General for remittance to London. This sum is going to the purchase of a squadron of forty-eight Spitfires, which will be manned entirely by Belgian pilots serving in the R.A.F. Each machine will be known by some name famous in the history of the Belgian Congo.

Some of these Spitfires have already gone into action, and the pilot of one of them has just had the distinction of shooting down a Focke-Wulf 190, the Nazis' newest and most dangerous fighter-bomber. This has rarely been encountered yet, but has quickly come to be considered a formidable opponent.

The Colonial War Relief Fund not only helps Belgian prisoners in Germany, sends food parcels to under-nourished families in Belgium, and contributes to the welfare of Belgian refugees in various countries. A large part of the Fund goes to Belgium's allies; for example, the Lord Mayor has received several cheques from the Fund for assistance to

air-raid victims in England. A van for distributing gifts of clothing has also been presented to the Women's Voluntary Services in London by Congo donors.

AMERICA JOINS IN

SINCE war came to the Pacific, the United States are more and more needing their share of Congo raw materials, and helping to supply machinery and other essential manufactures in return.

The next Congo Trade Agreement will probably be a three-party one, and at the time of writing (August 1942), the Belgian Prime Minister, M. Pierlot, the Colonial Minister, M. de Vleeschauwer, Mr. John Cadbury, of the Ministry of Food, Mr. Samuel Day, an American Government expert, and other British and U.S.A. representatives are all in Léopoldville to plan still further development of the Congo's war production and armed forces.

HISTORY REPEATS ITSELF

A Stout Ally in 1914 and 1941

IN this story we have just outlined of the Congo's value as an ally, history is only repeating itself, though on a larger scale.

In 1914-18, as the following figures will show, the Congo mining and smelting industries were very small when compared with their present giant stature, but they made the same great effort they are making today to expand their output in order to keep the Allied war machine fully supplied:

COPPER

	<i>Tons</i>
United Kingdom imports from Belgian Congo in 1914	3,766
" " " " " " 1916	13,178
Belgian Congo agreed <i>minimum</i> supplies to United Kingdom for 1942	144,000

DIAMONDS (*mainly industrial*)

Congo production, 1914	24,000 carats
" " 1916	58,300 "
" " 1940 (provisional figure)	10,900,000 "

GOLD

Congo production, 1914	1,721 kilogrammes
" " 1916	3,296 "
" " 1941	19,219 "

Turning to vegetable products, we see the same great increase in Congo production during the last war, and the same immensely higher starting-points from which a similar ascent is being made today:

PALM KERNELS

	<i>Tons</i>
United Kingdom imports from Belgian Congo in 1914	412
" " " " " " 1916	16,328
Belgian Congo anticipated exports to United Kingdom for 1942	50,000

PALM OIL AND PALM KERNEL OIL

	<i>Tons</i>
United Kingdom imports from Belgian Congo in 1914	150
" " " " " " 1916	2,900
Belgian Congo agreed <i>minimum</i> supplies to United Kingdom for 1942	25,000

COPAL

United Kingdom imports from Belgian Congo in 1914	850
" " " " " " 1916	6,200
Belgian Congo agreed <i>minimum</i> supplies to U.K. for 1942	7,000

In the two years from 1914 to 1916, the Belgian colonists doubled their output of copper, gold, diamonds and palm oil, and trebled that of palm kernels. During the whole course of the first World War they provided Great Britain and Ireland with more than half their supplies of copal, and around 5 per cent. of their copper, palm kernels, palm oil and rubber.

Similarly in the military sphere, General Gilliaert's forces, victors of Asosa and Saïo in the Abyssinian campaign of 1941, had their forerunners in the Congo armies of 1916, which did a great deal to put an end to German power in East Africa. Between April and June of that year they drove the enemy from the provinces of Ruanda and Urundi, which were subsequently awarded to Belgium under mandate of the League of Nations, and are now adding their quota to the Congo's supplies of tin, gold, silver, rare-earth metals, and tropical produce. Subsequently, in naval operations on Lake Tanganyika, and a brilliant campaign culminating in the capture of Tabora in September 1916, they materially helped Great Britain to wrest from Germany what is now Tanganyika Territory.

THE CONGO'S RESOURCES AND THEIR USE IN WAR

WHAT are the Congo's resources in the materials which have so far been called for by the British Government, and to what use will they be put?

GOLD

The importance of gold during the first phase of the war needs no emphasis. By keeping up the rate of sterling on the international market, it influenced supplies of every finished weapon or raw material of war which Great Britain needed to import, and so was itself regarded as a prime weapon.

The Congo is the twelfth gold-producing country in the world. There are more than twenty gold-mining companies, owning seventy mines, the chief being those of the Société des Mines d'Or de Kilo-Moto. Several hundred million francs are invested in the industry, of which 230 million are accounted for by the Kilo-Moto mines. Approximately half the gold produced in the Congo comes from these mines (8,700 kilogrammes out of a total of 18,000 in 1939), and a large part from the Compagnie Minière des Grands Lacs Africains (3,100 kilogrammes in 1939). Together with the Minière de la Tele company, these mines produce about 80 per cent. of the total Congo output.

Remaining deposits are estimated at 100,000 kilogrammes.

In peacetime, output of gold was carefully controlled by the directors of the principal Congo companies, to avoid any sudden expansion or contraction that might upset the bullion market or lead to undesirable speculation on the stock exchanges. The aim was a moderately but smoothly rising curve of returns.

In the period of American and Japanese neutrality, the Congo Government called upon the companies to abandon this policy completely in favour of maximum output. It was computed that without importing new plant, output could be raised by at least 15 per cent., and we may suppose that this was wholly or partly achieved during 1941, though no figures have been published.

As already described, the changing world situation has put an end to the drive for gold, and priority is now given to tin and copper.

COPPER

During the past few years the Congo has supplied about 6 per cent. of the world's output of copper (production in 1938 and 1939, 124,000 and 120,000 metric tons respectively, out of world totals of 1,982,000 and 2,200,000). Exports were 122,000 tons in 1939 and 160,000 tons in 1938.

This is no measure of what the Congo mines can contribute to the Allied war-chest if need be, for production has been restricted under the Copper Producers' Association agreements. In 1939 the potential annual output of Congo copper was estimated at 230,000 tons.

The entire production of this metal in the Belgian colonies is controlled by the Union Minière du Haut Katanga, a great company with a capital of 300 million francs. Their main concession is some two hundred miles long by thirty broad, and still appears to contain over $4\frac{1}{2}$ million tons of copper deposits. These vast reserves are surpassed only by those of the Chile company, the Kennecott Corporation in the United States, and perhaps one or two Rhodesian producers. The two biggest mines, named Prince Leopold and Kambove, are equipped with electric mining gear and automatic decaging machinery. One of the great mechanical navvies will scoop out more than two cubic yards of ore

at one bite. With the aid of twenty men, it will do the work of two hundred. The ore goes to several centres in the Congo itself for treatment.

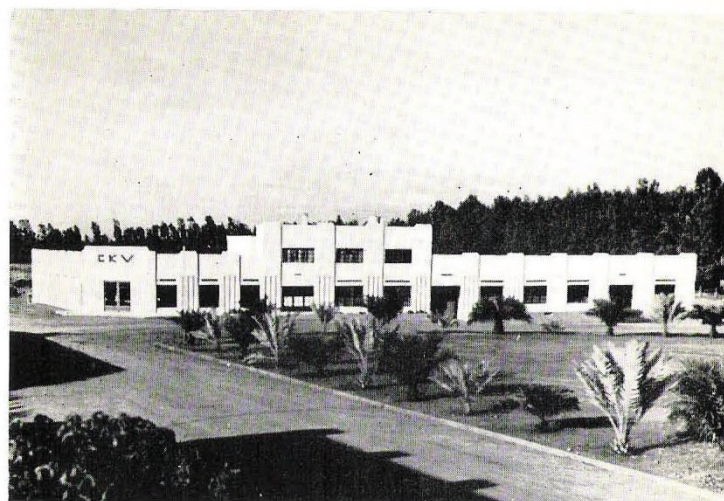
The works at Jadotville can handle 100,000 tons of ore per month by the mechanical concentration process, turning out concentrates with 35 per cent. copper content. There is also complete washing, drying, crushing and electrolytic plant for producing pure copper in cathode form, and electric furnaces specially designed to produce copper-cobalt-iron alloys direct from an ore in which all three metals are present. In 1938, 3,600 tons of white cobalt alloy and 1,400 of red were produced.

Cobalt being of the utmost importance in armament work for incorporation in high-duty alloys, a special effort has been made to increase production, and in spite of all wartime difficulties, new works were recently completed at Kolwezi, an obscure village which has suddenly become a modern town. The new smelter is designed to handle up to 40,000 tons of cobalt-bearing ore per annum.

The richest copper ore is treated at Lubumbashi in water-jacket furnaces. This plant can also deal with ores impregnated with sulphur.

There is another concentrator at Kipushi, which treats part of the ore from Prince Leopold workings before passing it on to Lubumbashi.

The Congo is the fifth copper-producing country in the world. Fortunately the four leading ones (United States, Chile, Canada, Rhodesia) are also within the Allied orbit. In spite of this last fact, there will be a steady call on the copper resources of the Congo, so vast is the quantity of this metal consumed in wartime for armaments and all branches of electrical engineering, including radiolocation and radio communication with tanks and aircraft. The brass of shell-cases and the bronze much used in general engineering and shipbuilding are of course alloys of copper. The importance



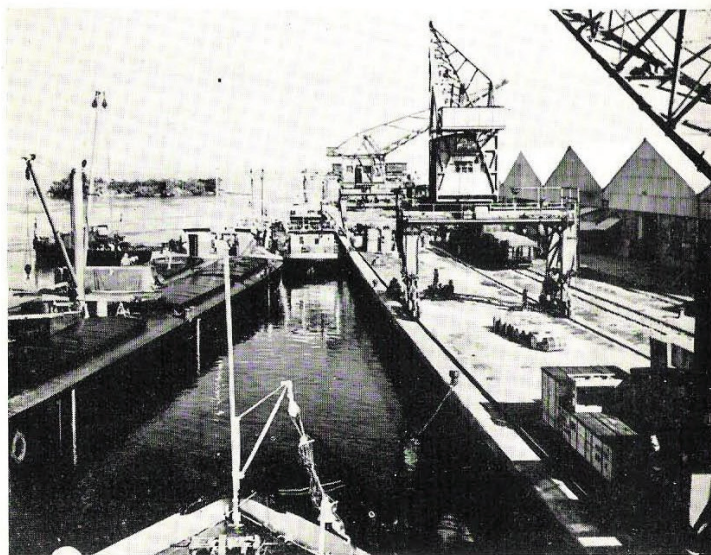
Modern commercial buildings at Usumbura.



A corner of the native city of Kinshasa adjoining Leopoldville.



The native market in Leopoldville.



Leopoldville : the port. Shipping at one of the quays.

of it was vividly expressed by Mr. Donald Nelson, head of the U.S.A. War Production Board:

"One type of bomber that is now defending our freedom requires more than two miles of copper wire to keep it flying. Another type of plane that we are using requires 500 lb. of copper. A battleship uses 2 million lb. of copper. If there were no copper, our big guns all over the world would be silent and helpless."

As we have seen, the 1942 Agreement already calls for 16 per cent. more copper from the Congo than the previous one.

TIN ORE AND TIN

Tin has a thousand peacetime uses, chiefly because it is the only common metal which is both harmless and tasteless when left in constant contact with foods.

In war it is of prime importance for the production of bearing metals, and bronze, which enters so largely into shipbuilding and machinery. Normal users must consequently find substitutes. The vital need for tin in modern warfare is shown by the lengths to which Germany has gone in this direction. Thus the tin tubes which led from cellar to bar in the beer-houses of Germany have all been collected and replaced by a new alloy steel, which is said to be just as effective.

Even in normal times the Congo is the sixth producer of tin in the world, coming after Bolivia, Malaya, the Dutch East Indies, Nigeria and Siam. This fact becomes doubly important now that three of these areas are in Japanese hands.

The output of tin in the Congo is therefore being pushed to the maximum, with great success, for the country has already risen from sixth to second rank among world producers. In theory, the restrictions imposed by international agreement are still in force, but in fact the limit

for the Congo is being increased to keep pace with production capacity.

Congo ore takes the form of exceptionally pure cassiterite, giving nearly three-quarters its weight of refined tin.

Before the war, much ore was exported and little tin, but ever since Belgium entered the war, the policy has been to smelt the highest possible proportion of ore on the spot. In the first year after the invasion, tin was more readily saleable for dollars than ore. This aspect no longer has to be considered, but the fact remains that tin naturally requires much less shipping space than the corresponding quantity of ore; also, by smelting in Africa, European workers can be released for more skilled tasks which could not be entrusted at present to Congolese labour.

New smelter plant has been built since May 1940, and extensions are still being made. The great effort put forth and its success are strikingly shown in the following figures:

Exports of Tin Bars from the Belgian Congo

<i>Year</i>	<i>Metric tons</i>
1937 . .	2,281
1938 . .	1,813
1939 . .	1,330
1940 . .	9,732
September 1940 to October 1941 . .	18,000 (provisional figure)

Several companies have increased their output by 50 to 60 per cent., achieving this feat in spite of the fact that the Army has taken 30 to 40 per cent. of their European staff.

It is hoped that the chief company's plans for raising their pre-war capacity of 8,000 tons to 20,000 will soon be completed, and will enable the Congo to double the 1940 figure.

In any case, it seems certain that in 1942 the Congo will provide one-quarter of the Allies' total supplies of tin, a very important contribution towards making good the serious loss incurred in the Far East.

TUNGSTEN (OR WOLFRAM) ORE

This metal has been largely used for lamp filaments, but still more important today is its incorporation in self-hardening high-speed tool steels.

Some 36 per cent. of the world's tungsten came from China, now almost cut off from the Allies. Another 20 per cent. was from Japanese colonies or Japanese-occupied countries. This is why the British Government has called for all the tungsten ore the Congo can produce.

In peacetime the output was very small, but it is hoped that when the question is one of filling a vital need of the Allied war factories, and not of competing with better-placed producers, more can be achieved.

RUBBER

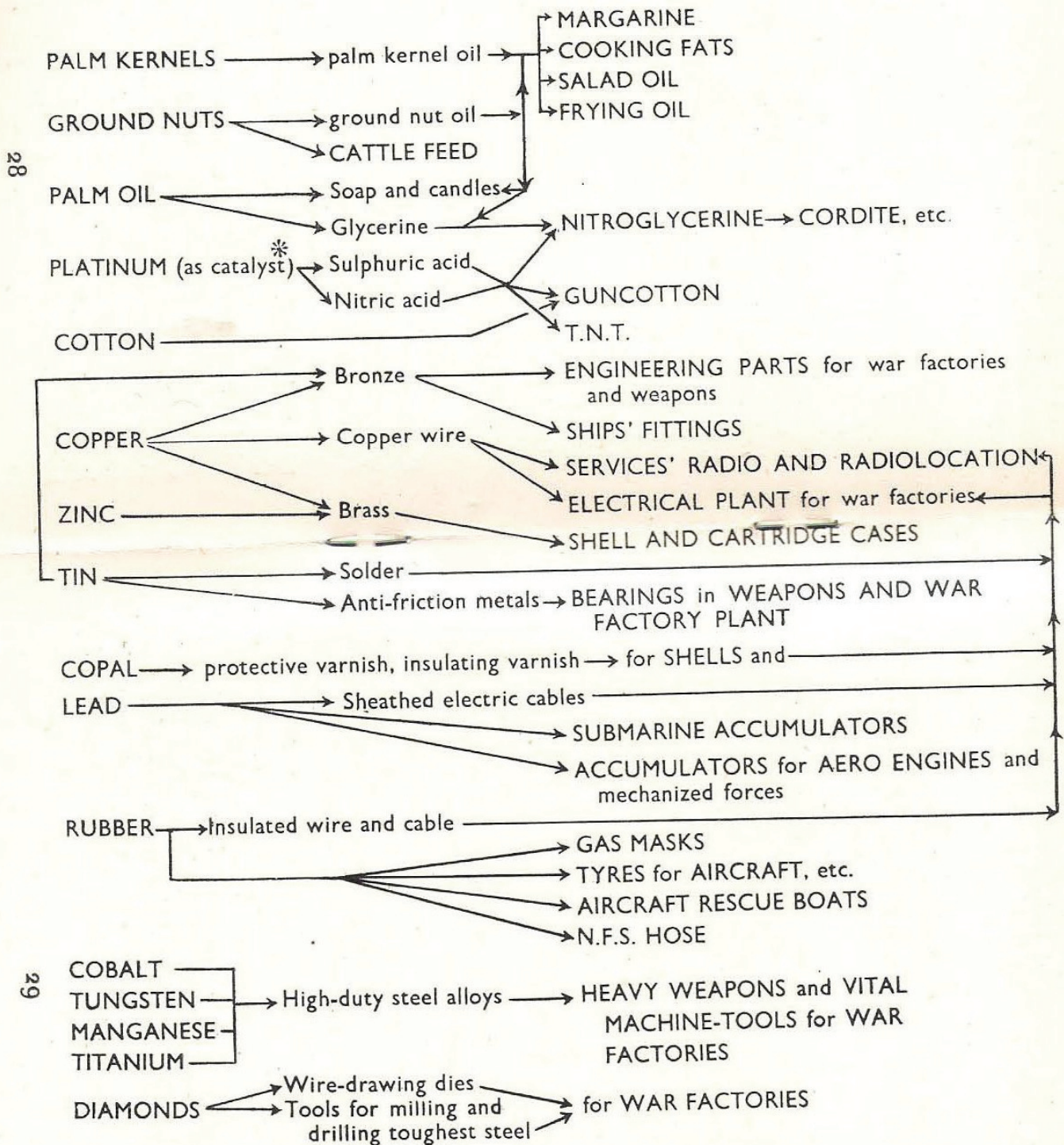
Trees, creepers and shrubs yielding rubber grow wild in the Belgian Congo in great profusion. In the early days of the rubber industry, around 1900, up to 5,000 tons a year of wild rubber were exported from the Congo.

When later the vast plantations in the Dutch East Indies and British Malaya flooded the world with more rubber than the industry could absorb, there was little use for this wild rubber, and shipments fell to a few score tons a year.

Now that Japan has robbed the Allies of the normal sources of more than 90 per cent. of the world's rubber, every pound of the wild product from the Congo will help to fill the dangerous gap in Allied supplies. Every ton will keep forty vehicles on the road which might otherwise be laid up for lack of tyres. Everyone knows the thousand

HOW THE BELGIAN CONGO EQUIPS THE UNITED NATIONS FOR WAR

CONGO RAW MATERIALS —————> give VITAL FOODS & WEAPONS



* This use of platinum is now tending to disappear owing to the discovery that fused silica can serve the same purpose. Other uses of the metal are described in the text.

other uses of rubber in peace and war, some of which are absolutely vital: gasmasks; N.F.S. and A.R.P. hose and pumps to fight fire-bombs; surgical equipment to save the lives of the wounded; collapsible boats for air rescue; water-proof canvas; electricity and radio.

Consequently a great campaign is being conducted to encourage the natives of the Congo to gather wild rubber, and the avenues of rubber trees planted round other crops to give shade are being tapped for the first time.

There are also European-owned plantations of Para rubber trees covering some 20,000 acres. For some years before the war, exports of plantation rubber only reached about 1,000 tons per annum owing to unfavourable markets, but when working at full pressure the area mentioned should now yield between 1,500 and 2,000 tons. The output of the trees increases gradually, being trebled between the first and eighth years of bearing. On the other hand, it takes five or six years for new plantations to come into bearing; hence the great importance of wild sources and of tapping shelter-trees.

A further supply may be obtained by reopening old plantations which were abandoned when the rubber market collapsed in 1922. In many cases these have been swallowed up in the jungle and there is no record of them, but an appeal has been made to all planters, missionaries, and Colonial Government officers to watch for them on their cross-country journeys, and report any finds to the authorities at once.

Plans were fortunately started four years ago to assist natives in setting out 25,000 acres of rubber plantations of their own. In case of a protracted war we may therefore hope to see the Congo later making good anything from 5 to 10 per cent. of the 100,000 tons of rubber for which England relied, in 1939, on countries now occupied by Japan.

COTTON

This is grown entirely by natives in their own fields, and bought by the cotton companies at prices fixed by the Colonial Government, which encourages planting and owns large research stations at which the finest Egyptian and American types of cotton are being acclimatised.

The crop has been steadily increasing over the past twelve years. In 1939 about 900,000 acres were under cotton, and some 120,000 tons were picked, giving about 40,000 tons of raw fibre after ginning. In 1940 and 1941 the figure was up again to 45,227 and 47,188 tons respectively, another notable success of the Congo's war effort.

Apart from the innumerable peacetime uses of cotton, which cannot be altogether abandoned, vast quantities are required in war for colonial service uniforms and for gun-cotton, cordite, and similar explosives: hence a campaign to encourage the natives to grow more, and hence the increase in British purchases from 20,000 to 30,000 tons per annum already noted.

COPAL

Copal is the chief constituent of various kinds of varnish and "dope." It is widely used in the armaments industry itself, and also in waterproofing, in electrical apparatus, and in the radio industry. The hard, semi-fossilized form of this gum is found buried deep in the mud brought down by the waterways at certain seasons of the year. At these times whole tribes of Congolese make great treks in search of it, and they succeed in collecting and selling to the traders up to 17,000 tons a year. In 1938, 15,000 tons were exported, and in 1939, 11,000.

So plentiful is this gum that in 1941 a special Export Regulation Committee was set up in the Congo to avoid unnecessary shipments that might have taken up space

needed for other essential goods. Now, however, that important sources of gums and resins in Malaya have been temporarily lost to the enemy, Congo resources may be more fully utilized as stocks fall off.

GROUND-NUTS

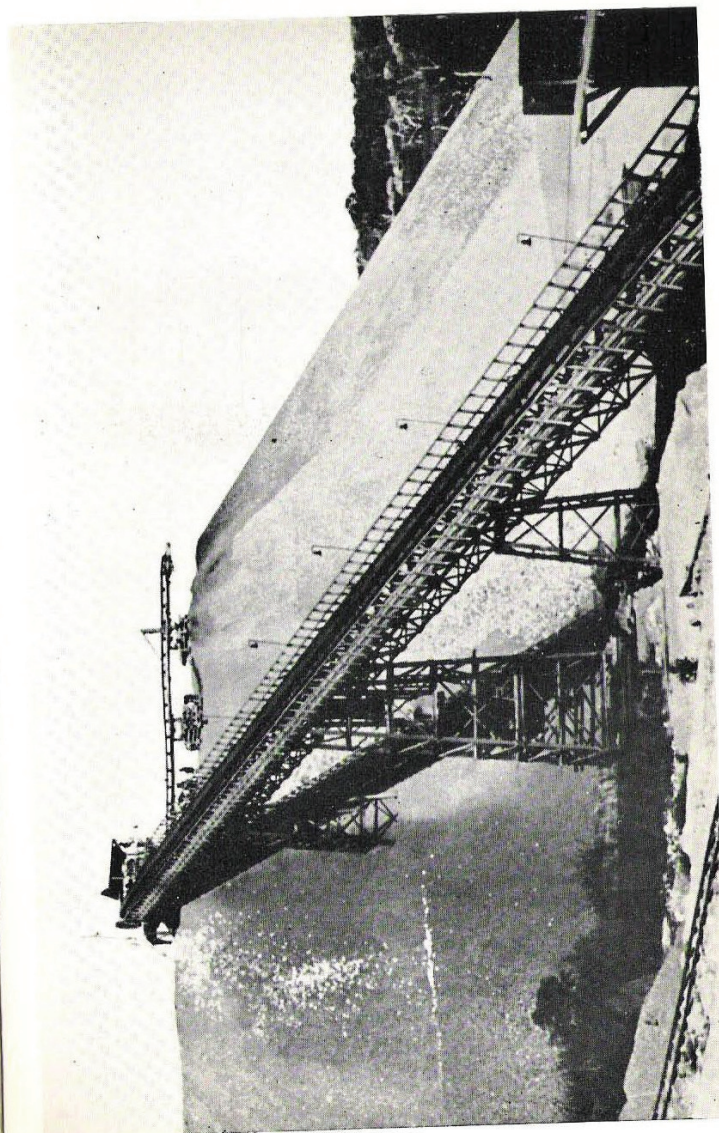
Not everyone who has chewed "peanuts" or "monkey-nuts," as ground-nuts are popularly called, realises that they are a valuable industrial commodity, of which every part down to the husk has its uses.

The nuts are first crushed in two series of cold presses, and the oil drawn off goes to make margarine and substitutes for olive oil. A further hot pressing gives fats for soap factories, and what remains is still good for cattle-feeding cake. Finally, chemical treatment of the husks will give glucose, acetic acid, and other useful by-products, or where no plant is available for this they make a good fuel for heating the presses.

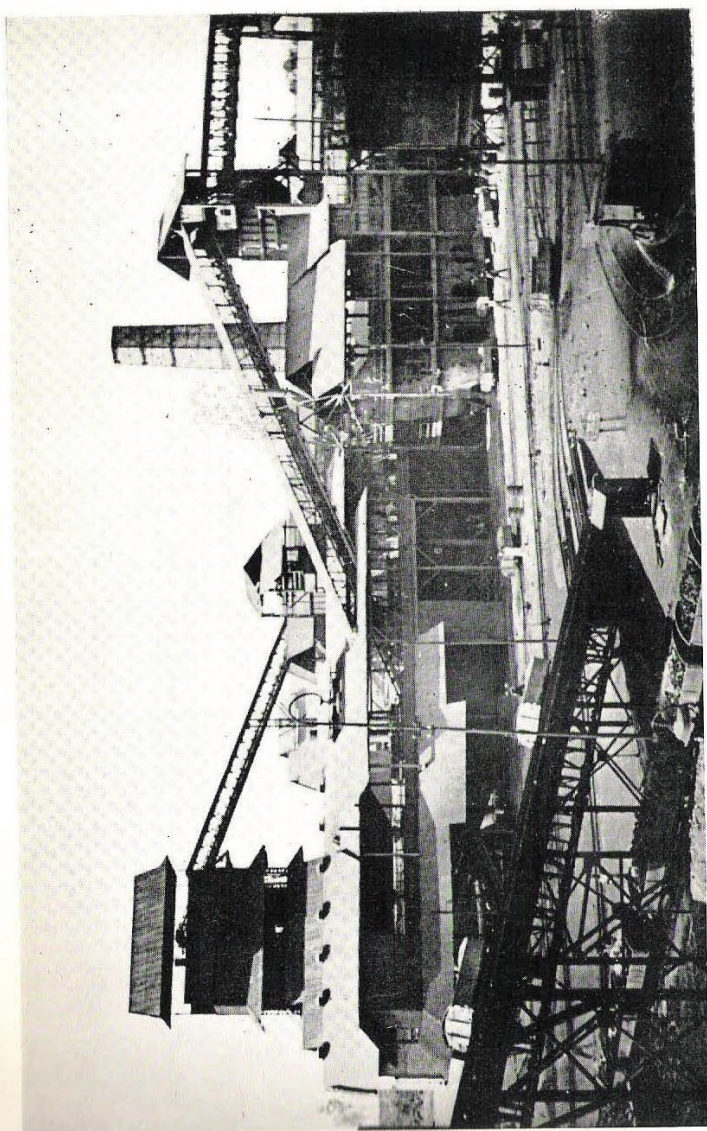
Exports in 1939 amounted to 5,850 tons, and in 1938 to 7,600 tons. Now that Burma is lost, China is almost inaccessible, and communications with India, the main source, are strained, Great Britain is to import whatever quantities the Congo can spare, as already mentioned. As pre-war exports were far below the amount of the normal crop, which has been estimated at 80,000 tons, we may hope that these shipments will be enough to keep margarine production at a reasonable level.

PALM KERNELS AND PALM OIL

The red and yellow plum-size fruits of the tall, straight palm tree grow in great bunches, a thousand or more together. They have much the same uses as ground-nuts: the higher-quality oil, usually extracted from the



Part of the plant of the tin mines at Kolumbree.



A copper refinery of the Union Minière at Elisabethville.

kernel only, is made into margarine, whilst other qualities derived from the pulp serve for soap factories and the like.

In the soap-making process, glycerine is also obtained from the oil. As is well known, this is vitally important in war for making explosives such as nitro-glycerine and cordite.

Some of the fruit is gathered by natives in virgin forest and sold to trading stations, but better results are shown by thinning out natural palm groves and keeping them clear of undergrowth. A still heavier crop, lower cropping and transport costs, and a finer quality of oil are given by cultivated plantations, regularly manured, which were beginning to oust all primitive methods before the war. Now that Far Eastern countries producing some hundreds of thousands of tons of palm fruit and oil annually are in Japanese hands, the Governor of the Congo has appealed for every method to be pressed into service to keep up Allied supplies.

From 1935 to 1938 the acreage of plantations of oil palms in bearing rose from 43,000 to 70,000. In the same years, the area of young plantations not yet bearing fruit was 50,000 and 57,000 acres respectively.

In 1938 there were in addition 60,000 acres of improved natural groves in use. Over 74,000 tons of oil were produced in all, 18,000 tons being from plantations or improved groves and 56,000 from wild fruit.

Exports of palm kernels in 1937-8-9 were 96,000, 89,000, and 83,000 tons respectively. It is expected that even after meeting the needs of the Union of South Africa and the Congo itself, at least 50,000 tons a year will be available for Great Britain.

SUGAR

In the 1938-39 and 1939-40 seasons, Congo production amounted respectively to 16,961 and 16,169 metric tons

(raw value). In 1940-41 it was down to 15,422 tons, owing to an unusually dry season.

This output is small in comparison with a world total of 18 to 20 million metric tons yearly, but it has been carefully controlled in view of international agreements, and there seems no reason why it could not be rapidly expanded, if need be, to make good the loss of sugar plantations in the Pacific war zone. In fact, exports were multiplied four times over the years 1932-37, and rose by 50 per cent. from 1936 to 1937. According to the last figures to hand, the chief producing company, the Compagnie Sucrière Congolaise (capital 60 million francs) had only about 8,000 acres under sugar, out of a concession nine or ten times that area. It takes rather more than a year for new canes to come into bearing.

The Compagnie Sucrière has very up-to-date equipment, including an extensive network of light railways to bring the canes straight from field to factory. Once the trucks have been filled with sugar-cane by the plantation labourers, the whole process of unloading, crushing, drawing off the liquid sugar, refining, crystallizing and packing is carried out by modern machinery.

Up to the present, although the British Government promised to consider using the Congo as a source of sugar in the first Purchase Agreement, they have not yet called for any supplies, no doubt because the United Kingdom's food needs could be adequately met by other means, with a more economical use of shipping. In accordance with the policy announced by Monsieur Ryckmans, the Congo makes no complaint of this, but has set about finding other uses for the sugar. More sugar foods are being given to the Congolese labourers, who prize them and will work the more readily for the war effort, and new markets have been found in Rhodesia, British West Africa, and Free-French Equatorial Africa, incidentally relieving the strain on other supply-lines of these colonies.

Sugar can of course be used as a source of glycerine for explosives, if supplies of vegetable oils fall short.

COFFEE

Nearly 160,000 acres are planted with coffee, and about 25,000 tons a year can be produced, or thirty to forty times the small quantity that used to come from the Dutch East Indies.

JUTE SUBSTITUTES

Urena Lobata and Punga are grown by natives of the Congo on their own plantations, covering some 23,000 acres. These plants give fibres closely resembling jute, and can be used to make sandbags, ropes, hawsers etc. in the same way. About 8,000 tons a year can be produced.

This amount, though small in comparison with the 190,000 tons per annum normally imported from India, is likely to be a welcome asset under present conditions, as shown by the Order which came into force in Great Britain on the 20th July, 1942, making it an offence to throw away or destroy any rope or string.

The exact quantity of coffee and of jute substitutes to be sent to England under the Agreement of June 1942 has been left to be fixed in the light of developments.

CONGO PRODUCTS NOT COVERED BY THE ANGLO-BELGIAN AGREEMENTS

OUR survey of the Financial Agreement and the two Purchase Agreements gave a first glimpse of the products that the Congo can contribute to the war effort, but there are very many others which for one reason or another were not

covered by the Agreements, often because supplies are sufficiently ensured by private enterprise.

In some cases, of course, other sources, more economic or nearer at hand, have so far proved adequate.

In other cases shipping space could not be spared, or South Africa needed the whole supply available in the Congo.

With the spreading and intensification of the war since December 1941, the following resources may also be of vital importance to the Allied cause.

OTHER MINES

The country is particularly rich in minerals, and mining is the principal industry. The commercial value of mining output in 1937 has been estimated at 2,370 million francs (£16½ million at the rate of exchange then ruling), against 1,530 million francs in 1936.

In 1938 there were 71 gold mines, 57 diamond, 29 tin, 10 copper, and also cobalt, coal, iron, radium and salt mines. Many of the mines chiefly producing these minerals also extract smaller but very valuable quantities of rare-earth metals and other scarce substances which are essential in war, to form heavy-duty steel alloys, for example, and for the manufacture of radio components used in military communication and in radiolocation.

The Congo is the world's leading producer of industrial diamonds, radium and cobalt, and, as mentioned above in connection with the Anglo-Belgian Agreements, holds second place for tin, fifth for copper, and twelfth for gold.

DIAMONDS

More than four-fifths of the Congo output consists of industrial diamonds. These are a key requirement of modern warfare, which the Nazis have continually striven to obtain from South America by air, and the Ministry of

Economic Warfare has been at equal pains to intercept. A constant supply is needed by armament factories for drilling and milling machines. In the form of fine wire-drawing dies, they are also vital to the radio and electrical industry.

Everything has, therefore, been done to increase the Congo output of diamonds, which was 4,926,000 carats in 1937, 7,206,000 in 1938, and 8,361,000 in 1939.

In 1940 it was brought up to 10,900,000 carats, a notable achievement in face of the handicaps of that year, representing 80 per cent. of world output by weight. It may be revealed that the work of the diamond mines in 1941 was still more successful, though the figure is not for publication.

Antwerp was the great centre for cutting and mounting both industrial and gem stones, and the sudden loss of this town paralysed the market for some months, during which production largely accumulated in idle stocks in the Congo. In June 1941, however, agreements were made under which the whole of the Congo output of diamonds is sent to London for sale and distribution. In fact, all diamonds except British Guiana and Brazilian, or over 90 per cent., are now sold through one central organisation.

With the exception of a few hundred carats, the whole Congo output is due to the Société Internationale Forestière et Minière ("Forminière" for short) and its associated companies.

MANGANESE

Manganese is again a product of the Union Minière du Haut Katanga, mentioned above under the heading of "Copper." It is of prime importance in war for producing high-duty ferro-alloys. Output of ore was 27,000 tons in 1937 and 8,000 in 1938. The Union Minière's *Cobalt* has also been referred to above. Other minerals of which this vast undertaking has practically a monopoly in the Congo are lead, zinc, palladium, and radio-active ores.

LEAD

Lead.—4,625 tons were produced from Congo ore in 1938. Large supplies are needed for covering electric cables, for small-arms ammunition, and for the plates of accumulators. Besides their well-known uses in petrol engines and in radio, which are at the heart of mechanised warfare, accumulators provide the motive power of submarines when under water.

Over 850,000 metric tons of lead per annum can be produced in the United States and the British Empire. This, however, is only about equal to peacetime consumption in the U.S.A. and United Kingdom alone. In spite of the fact that a further 200,000 tons a year from Mexico is no doubt largely available to the Allies, and that only about 80,000 tons are lost through the fall of Burma, a shortage is beginning to be felt in England. This is evident from the drastic restrictions just placed on the use of lead in buildings (July 1942), which totally forbid the use of lead in most kinds of plumbing, rainwater pipes, gutters, cisterns and damp-proof courses. The shortage is perhaps due to the difficulty of bringing lead from Australia, the source of about half the Empire output, while the struggle with Japan is at its height.

Under these conditions a contribution from the Congo, even if only of four or five thousand tons, should be very helpful.

ZINC

Zinc is of course a constituent of brass, of which shell and cartridge cases are made. Production of concentrates in the Congo was 11,251 tons in 1938. In that year 8,279 tons of spelter were smelted from Congo concentrates, out of world production of 1,589,000 tons. About half the world's output comes from the American continent, the United States being the largest producer. It may therefore not be necessary to draw on the Congo zinc mines, and will probably be preferable to devote all energies to other metals.

PALLADIUM

Palladium is used to make accurate, permanent graduation scales for scientific instruments, and is more than ever needed in wartime. In 1937, 389 kilogrammes were produced from Congo ore.

RADIO-ACTIVE ORES

In 1937, 1,052 tons were exported. The average annual *Radium* production from these ores amounted in peacetime to 15 grammes, but unfortunately there is no plant in the Congo itself capable of extracting the radium. This process was carried out at Oolen, near Antwerp.

Many other Congo mining industries were in the same difficulty. The steps taken to overcome it are, of course, to some extent secret at present, but it may be stated that these ores are being shipped to the United States, which imported 1,071 long tons of uranium ore from the Congo in 1940, valued at over 2 million dollars.

PLATINUM

Platinum was in great demand during the first World War as a catalyst for speeding the process of manufacturing sulphuric acid and nitric acid, which are the base of most high explosives, including guncotton, t.n.t., nitroglycerine and cordite.

This use is now declining, owing to the discovery that fused silica will serve the same purpose; but platinum is still indispensable for contact points in electrical apparatus, for laboratory vessels and astronomical instruments, and in the construction of pyrometers used in controlling various steel processes. Its importance in wartime is therefore obvious.

It is mined in the Congo by the Comité National du Kivu, the Mines d'Or de Kindu, and once again the Union Minière du Haut Katanga. In recent years, from 50 to

100 kilogrammes of the metal have been produced annually from the Union Minière's ores alone.

SILVER

Production in the Congo in 1938 amounted to 97,091 kilogrammes of fine silver, plus 23 kilogrammes from the adjacent Belgian-mandated territory of Ruanda-Urundi. Expressed in ounces, this would be roughly $3\frac{1}{2}$ million, on a world production of 263 million fine ounces.

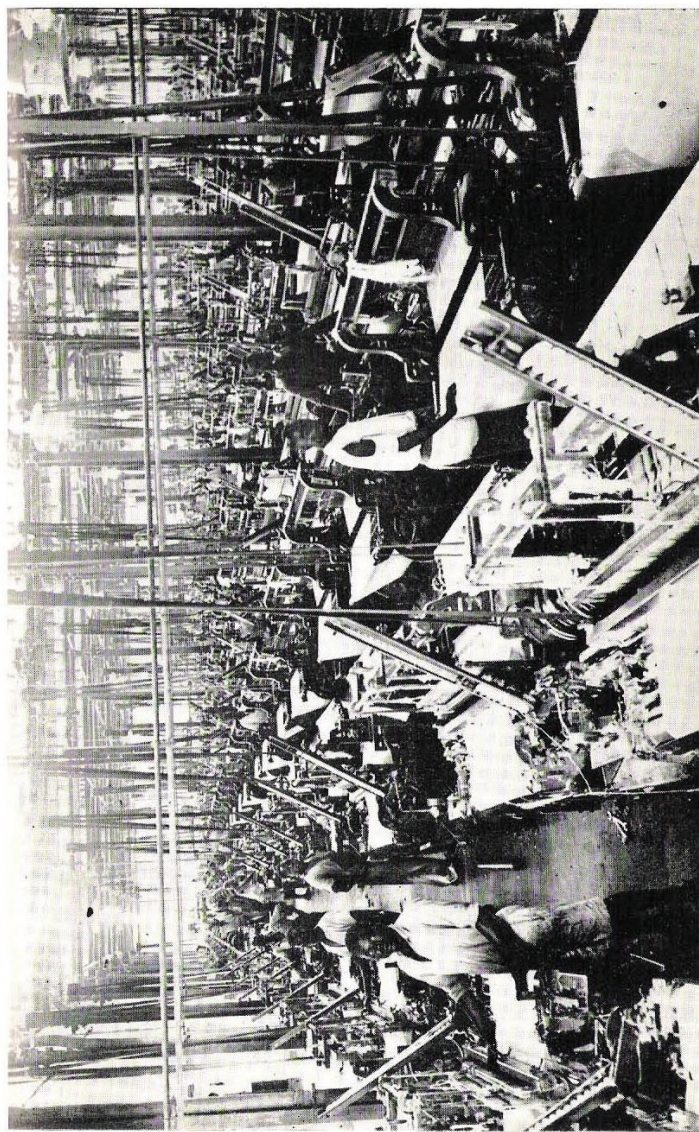
Now that faith in gold as the only possible basis for sound finance has been shaken, silver is less than ever valued as a backing for currency. In the United States the New Deal bimetallist law has not been repealed, but it is beginning to be nullified in practice. Mr. Morgenthau has been allowed to deliver silver from Treasury stocks for making "bus bars", the heavy connecting rods linking up units of electrical plant in various industries, which are usually made of copper. We may expect that the tendency to put silver to industrial uses will increase, and that Congo silver will be pressed into service in the same way, or more probably to replace tin in solders and bearing metals.

RARE-EARTH METALS

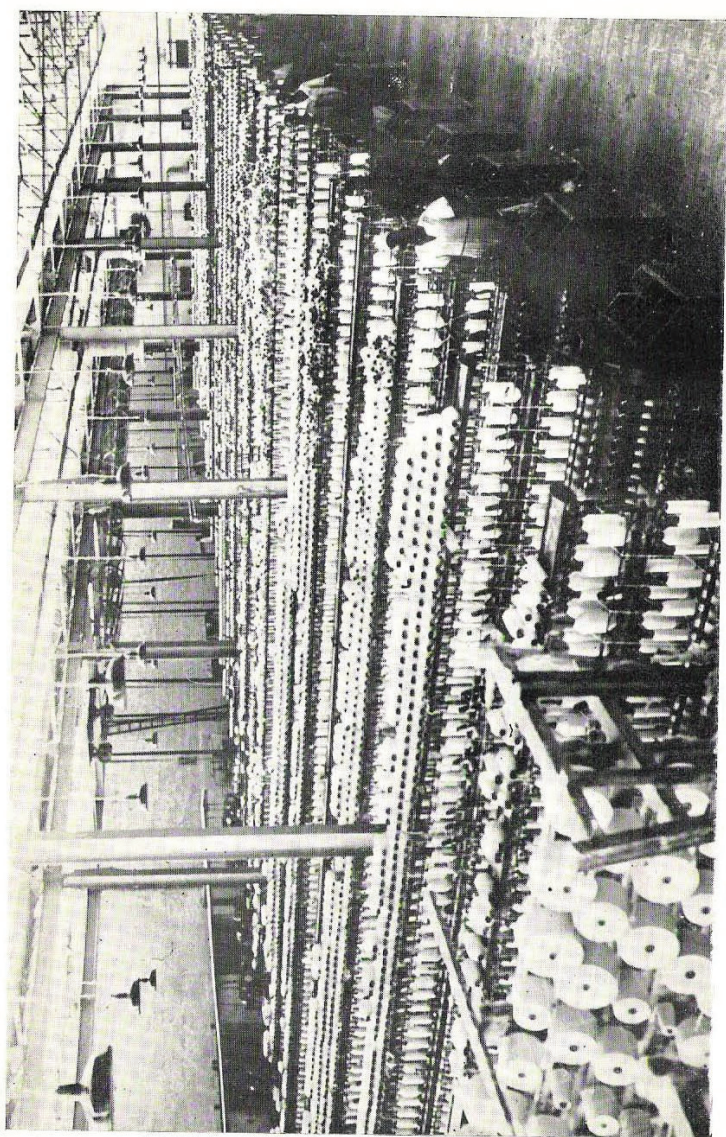
Niobium (or *Columbium*) and *Tantalum* are widely used for the filaments of electric lamps. They are mined by the Société Minière du Maniema, and by the "Geomines" company at Manono. About 130 tons of tantalum were produced in 1938.

The alloy-steel industry is trying to cut down the consumption of tungsten (see p. 27) by using sintered carbides of tungsten and tantalum.

In 1937 the "Minetain" company produced $7\frac{1}{2}$ tons of columbite (mixed niobium-titanium ore). Of this ore, 61 tons were exported in 1939.



Leopoldville Textile Factories Company—a weaving shed.



Leopoldville Textile Factories Company—a spinning shed.

42

Titanium, Thorium, Cerium, Yttrium and Lanthanum are mined by the Cie. Minière du Congo Belge. These rare-earth metals have varied and important uses. Cerium, for example, forms part of the so-called "flints" for gas lighters, the need of which every housewife has felt with the disappearance of Belgian and Swedish matches from the shops. It is also an ingredient of gas mantles, and a derivative is valuable in medicine. This is a far from exhaustive account of its usefulness.

Titanium is normally used to make pigments of various colours, but in wartime it can be used in alloys to eke out other steel-hardening metals.

Rutile with a 94 per cent. titanium content is also found on the concession of the Minière des Grands Lacs. The "Somuki" company has deposits of Bastnaesite, a source of cerium and lanthanum.

NON-MINING INDUSTRIES

Besides these great primary industries, the Congo has its intermediate and manufacturing ones. In a tropical, colonial country these are of course relatively undeveloped, manufactured goods in great variety being easily imported in time of peace.

Only chemicals, textiles, and their allied industries call for special mention.

The following were some of the production figures for these in 1938:

Sulphuric acid	13,100 tons
Oils treated by hydrolysis	1,650 „
Glycerine	50 „
Cheddite	407 „
Soap	5,000 „
Cloth	12,500,000 yards

The chemicals are produced by the Société Générale Industrielle et Chimique du Katanga ("Sogéchim"). Their works at Jadotville include a sulphuric-acid plant with a capacity of 30,000 tons yearly, and also produce fatty acids (3,000 tons annual capacity in 1936), sodium chlorate, caustic soda, and hydrochloric acid.

By working at full pressure, this company should be able to supply all the mining explosives needed in the Congo, and possibly part of the ammunition for the colonial army as well, thus releasing valuable shipping space for other goods.

Small quantities of chemicals are supplied to other parts of Africa, but they are mainly for local consumption.

The textile industry is making an important and direct contribution to the war effort by providing uniform material, bandages, dressings, cotton-wool, sheeting, and tent canvas for the Belgian Colonial Army and Free French Forces, which are not only garrisoning their own territories but have played a full part in the Abyssinian and Libyan campaigns. For this purpose the only mill, which is at Léopoldville, has been extended, and has been made almost self-sufficient by setting up machine-shops to cast, finish and repair loom parts. Both mills and machine-shops are to be further enlarged to cope with a growing demand for military equipment from British colonies in Africa also.

The piece-goods are sent to workshops in Free French territory to be made up.

In peacetime the only other secondary industries in the Congo are those concerned with preparatory treatment of raw materials (cotton ginning, extraction of oil from seeds and kernels, etc.), or small works catering for purely local needs.

New secondary industries are beginning to make their appearance under the pressure of war. Essentials which are now almost unobtainable are paper, wood-pulp and matches, formerly imported from Belgium, Scandinavia and Japan.

A company has now been formed with the object of manufacturing three million boxes of matches a year. They have an option on the machinery needed, and will have State help in the form of duty-free imports and special terms for rail and river freight in the Congo. Two species of tree found in the Colony but not yet put to any commercial use are suitable for making matches—the baobab and the pokopoko.

Trials are also being made of local timber and papyrus from the tropical swamps in the manufacture of pulp. It is hoped to supply pulp to South Africa, as well as to a packing-paper factory now being erected in Léopoldville.

Finally, some of the weapons for the Colonial Army are now manufactured on the spot.

ANIMAL AND VEGETABLE WEALTH NOT COVERED BY THE ANGLO-BELGIAN AGREEMENTS

The chief wealth of the Congo, after the mines, lies of course in its crops and animal life.

Several hundred tons of hides and skins, and from a few tons up to two hundred tons of ivory, according to the state of the market, are exported in a year.

The following vegetable products not already mentioned in connection with the Anglo-Belgian Agreements are exported at the rate of more than a thousand tons per annum : Timber (47,000 tons in 1939), maize (20,000 tons in 1939), cattle-feed cakes (3,000 tons in 1939), raw cocoa, fresh fruit, rice, tapioca flour, cottonseed oil and sesame.

The total production of most of these is unrecorded, but in 1938 it was certainly higher than the following :

Rice	46,000 metric tons
Maize	68,000 " "
Tapioca flour	33,000 " "

Development of these natural resources often progresses at a great rate, giving good prospects of rapid action to replace sources of supply closed by the war in the Pacific. Thus from 1936 to 1937 alone output of timber doubled and the maize crop trebled. In 1939 maize was a principal export from French Indo-China to this country, and timber from Thailand.

The area of forest being worked for timber in 1938 was 250,000 acres, which produced over 2 million cubic feet of logs and nearly half a million cubic feet of sawn wood. Natural reserves are practically inexhaustible, the area mentioned being less than one-tenth of 1 per cent. of the vast forest regions of the Congo. Nevertheless, a far-sighted afforestation policy is in force.

The only obstacle to increasing the timber supplies is that where customers require seasoned wood or sawn scantling sizes it is difficult to expand the kiln-drying plant and the sawmills quickly enough. In 1941 equipment was insufficient to cope with the demand from the Union of South Africa alone. Some supplies were received in return from the Union's factories, but these do not manufacture the finned tubing used in drying-kilns, which has to be brought from Europe or America. In spite of all such difficulties the "Agrifor" company (Société Agricole et Forestière du Mayumbe) have gone ahead with extensions to their plant, and the position is improving.

CONGO CO-OPERATION WITH SOUTH AFRICA

MUTUAL help between the Union and the Congo has developed greatly since the war, each supplying the other with produce that normally came from more distant sources

now less accessible. There are regular sailings between Boma and Capetown, and special arrangements have been made for transporting timber across the Union by rail, with very satisfactory results. In the Congo itself, a great deal of timber is still carried by elephants.

The Congo provides the Union with timber, palm oil, cocoa beans and bananas, and receives South African manufactured goods in return.

POTENTIAL RESOURCES OF THE CONGO IN A LONG WAR

So far we have spoken only of resources already being worked on a fairly extensive commercial scale.

Potential wealth must also be taken into account in the balance-sheet of Allied war resources, even where it can only be tapped by costly and difficult means calling for a long-range programme of development. The need for heroic expedients and the possibility of a long war have been greatly increased by the Pacific conflict, and no likely source of vital supplies must be overlooked.

In the vegetable kingdom, the potentialities of the Congo are almost unlimited. At different altitudes and in different latitudes the most astonishing variety is or can be grown. Few are the useful plants that have not been raised in the Congo either for local use or experimentally. Everything from the wheat and vegetables of temperate zones to the exotic pineapple is part of the local food supply.

SELF-SUFFICIENCY IN FOOD

To decrease the call on imported canned goods from Europe and the U.S.A., a great effort has been made to improve supplies of fresh food. By co-operative methods of

production and transport, the amount of garden and dairy produce sent from the Kivu district to the equatorial zone was increased from 20 tons per month in 1941 to 60 tons per month early in 1942.

REAL SILK

Plans were set going in 1938 to provide 1,500 natives with their own mulberry plantations, and huts for breeding silk-worms. It is very fortunate that these efforts are now beginning to give results, for silk is essential in modern warfare, and the principal suppliers were, of course, China and Japan. It is used in manufacturing parachutes, parachute flares, insulated wire for radio windings, and for many other important purposes.

In the latter half of 1941, 1½ tons of cocoons were brought in, and in view of the broad basis laid down for this new industry four years ago, it is hoped that this figure can soon be multiplied twenty times over.

Parachutes woven from Congo silk are already being used by the R.A.F.

The silk is of such high quality that first-grade "gut" for surgical stitching can be produced. In 1941, over 200,000 lengths of this were made, and 1 million is the target set for the current year (1942).

QUININE

Cinchona bark, the raw material of quinine, is grown on 1,500 acres by the Synquinac Company, and four years ago subsidies of several hundred pounds were granted to extend plantations of this vital medicinal plant in various districts.

Quinine is being extracted locally. During 1943, new groves will yield bark, and the Congo will be able to meet all its own needs without calling on Allied supplies strained by the loss of the usual source, Java. Further, it is expected

that in the following year, the Congo will be able to supply all Africa with quinine to combat malaria.

SOYA

Soya, a product of Japan with a hundred uses, grows very readily in the Congo and will yield 2½ tons per acre in European hands, or about half that amount under native cultivation with primitive methods. It enters into margarine, chocolate, sauces, other composite foods, vegetable casein, glue, artificial textiles, cattle feed and varnish.

TUNG OIL

Tung oil, also called China Wood oil, can be replaced by copal for many purposes, but if necessary the oil itself can also be produced in the Congo. This is already being done on a small scale.

Tung oil is used in heat-proof varnishes, quick-drying enamels, brake-bands, and insulating materials for the electrical industry, among many other things. One chief source of this oil was Hong Kong, lost for the time being to the enemy, and the other China, whose communications with her Allies are now precarious.

GRAPHITE

Graphite, an indispensable high-speed lubricant, was mainly imported from Germany, Italy, Norway, Japan and Madagascar. The recovery of the last source will give us back about a quarter of the normal peacetime supplies of 16,000 tons per annum, but the route to be traversed is much longer than from the Congo. It will no doubt be necessary to investigate the Congo deposits thoroughly without delay. Concessions have been granted to two companies, but un-

fortunately reports on quality so far received are not very encouraging.

Oil has been found on the shores of Lakes Edward and Albert and in the Mayumbe region, but has apparently not given sufficiently plain promise of returns to tempt capital. Possibly in view of the loss of at least 50 million gallons a year normally obtained from the East Indies and Malaya, it will be worth while to make trial borings in the Congo.

GENERAL ECONOMIC TRENDS

STATE REGULATION OF TRADE AND INDUSTRY

In spite of the vastly different economic structures of the tropical, colonial Congo and of highly industrialised England, the general trend of economic development during the war and the economic problems arising have been alike in several respects.

As in England and elsewhere, the war has brought with it a great increase in Government regulation of industry and trade, facilitated no doubt in the Congo by the wide personal powers of the Governor-General, which are similar to those of the head of a British Crown Colony, and by the fact that there was already a certain amount of "mixed economy," that is to say enterprises in which the Government held at least a half-share of the capital and had nominal, though not always effective, control.

As in England, too, there is a tendency to regard some of the new spheres of State or semi-State control as the basis of a post-war economic policy.

Again, there has been the same controversy between public and some official opinion on the one side, and Army headquarters on the other, as to what proportions

of man-power should be, firstly, in the fighting line and, secondly, in production to keep the line supplied and equipped.

This controversy has been all the more acute in the Belgian case, because after the fall of the homeland the Army was necessarily small, and because Congo production comprises vital basic materials of first importance to the Allied war economy as a whole. There was thus a tendency on the one side to regard civilian production as unquestionably more important than the small army could possibly be, and on the other to make it a point of honour to whip up as large a new army as possible from all available sources, of which the Congo must naturally be the first.

Whatever the truth of the matter, it must be acknowledged that all protagonists had solely in view the furtherance of the Allied cause.

The services of Belgian Embassies, Legations, and Consulates in all the free countries of the world have now been enlisted in an intensive campaign to register and recruit new technical staff for Congo industry. We may hope that this will shortly solve the problem and begin to send output of strategic materials up to new heights.

GOVERNMENT CONTROL OF QUALITY

Uniform High-grade Supplies for British War Factories

Government intervention in the Congo has been of the most varied kinds.

First there is control of quality, prohibiting export of inferior produce and preventing any misuse of trade terms such as "Copal Lac," which have come to be regarded as a guarantee of high quality. This is only an extension of a principle accepted in the Congo long before the war. For more than ten years it has been illegal, for example, to export adulterated rubber, or plantation rubber containing

more than 15 per cent. in all by weight of water, non-coagulated latex, stickage, and vegetable impurities.

There is now a tendency, however, for this kind of control to widen into a virtual prohibition of new enterprise in certain fields, an innovation which would be open to stern criticism from the late-surviving but very vocal economists of the strict *laissez-faire* school. The same virtual prohibition occurs in England, in a hundred-and-one trades where it is impossible to open a new business because supply quotas are only granted on the basis of a percentage of pre-war turnover.

The following are some of the quality controls set up since 1939, which help to ensure a uniform supply of first-grade goods for England's war factories and for some of the essential consumer-goods industries of the Union of South Africa, including the furniture industry.

Logs of limba wood may only be exported if they come up to standard length and girth, and are practically free from clefts, irregularities, wormholes, etc.

Sawn wood must be clean-cut on the square, and of at least the length stated. It may be longer, unless consisting of packing-case boards or other work calling for correct sizes. Planed or finished work must also be of exactly the correct size, and there must again be practically no clefts, wormholes, sapwood, etc. Further, no export consignment is allowed to go forward without a signed declaration showing whether the wood is seasoned, kiln-dried, or chemically treated. The same Order lays down the names to be applied to various species of Congo timber.

Decorticated ground-nuts are inspected by the Customs at the frontiers, and may not be exported unless they are uniform in colour, are free from insects and mould, and contain less than 8 per cent. humidity. There are also limits of 2 per cent. for foreign substances, 15 per cent. for considerably damaged nuts, and 30 per cent. for slightly damaged ones.

PRODUCE OFFICES

Government Action to Improve Quality and Promote Sales

A Coffee Office has been set up to improve quality and increase sales. It is run by a Committee consisting of eight Government officials (mostly agricultural research experts) together with four representatives of the growers. All those genuinely connected with the coffee business may be members of the Office. No coffee may be exported without a licence from the Office, which may impose any condition it wishes, subject to the right of any aggrieved party to appeal to the Governor-General.

The organisation of these "Offices" is of some interest. The object is in each case to improve quality and output and to increase sales of some wild or cultivated product. The Offices so far set up have been given powers to actually engage in trade and industry, which would probably have been jealously denied to such a semi-State advisory and development body in most countries. Apparently there was some apprehension on this point in the Congo too, for the general Legislative Order of 15th October, 1940, which lays down the status of all such Offices, prohibits them from trading or engaging in industry unless expressly authorised to do so.

They are financed by Government loans or subsidies, which may, however, be recouped by taxes imposed for the purpose on the trade concerned, and collected by the Office itself.

The Offices have power to forbid exports of poor-quality goods. They may also administer funds for combating plant diseases or pests, and grant bonuses to members for excellence of quality or packing.

There is also a Pyrethrum Office, pyrethrum being a plant (feverfew) of which the flowers are used in making insecticides.

This Office collects a tax for inspecting pyrethrum flowers before export. Inspection is compulsory, and no flowers may be shipped unless they contain at least 1·2 per cent. of pyrethrine and come up to various other standards of quality.

PRODUCE COMMISSIONS

Price-fixing and Control of Exports

For several other products there are bodies known as Commissions which from the overseas buyer's point of view have much the same satisfactory influence on quality as the Produce Offices, but have sometimes wider and sometimes narrower powers.

The Urena and Punga (jute substitutes) Commission, for example, fixes minimum export prices. Like the Offices, this Commission controls quality of exports and charges a tax upon inspection, to recoup expenses. It is similarly formed of both Government officials and representatives of the trade.

Fine, silky jute-type fibres, or long ones, must be sorted out from inferior or short ones. A maximum of 10 per cent. humidity is allowed, and no foreign substance whatever.

The Palm Kernel Commission, on the other hand, amounts to little more than a Government contract to two large firms to purchase from natives or middlemen the whole of the kernels to be supplied to the British Government.

The Palm Oil Commission licenses exports of this product, and does not allow any oil registering over 8·5 per cent. of free fatty acid to pass, unless on some special grounds. In order to reserve shipping space for the best-quality oils, export is subject to a quota based on 1939 figures, except in the case of oil from cultivated plantations of selected palms, which may be shipped without limit.

A bonus of 20 francs per ton is paid for each decreasing degree of acidity below 8·5 per cent., and a further special

bonus for oil exported to Great Britain which shows less than 5·2 per cent. acidity, less than ·5 per cent. water, and slight traces only of any impurity.

Exports to Great Britain, U.S.A., the Rhodesias and the Union of South Africa may only be made by firms which exported at least 250 tons of their own oil in 1939, or by new plantations of selected palms producing that amount, or by syndicates of exporters who jointly fulfil these conditions.

Maize exports from the chief maize-growing provinces may only be made through the Syndicat d'Initiateurs Exportateurs du Lomami-Kasaï, which is empowered to fix minimum prices to be paid to the native growers.

A Copal Commission, consisting of a nominee of the Governor-General and four representatives of the trade, allots quota licences for exports of this gum. Only persons who exported 150 tons or more in 1939, or groups of persons who jointly did so, may now engage in the trade. The use of the terms "Copal du Lac Léopold II" or "Copal Lac" is restricted to traders around the lake and in certain well-defined neighbouring districts, who have long made it a rule to refuse to buy any but scraped, washed and sorted gum from the native collectors. All other Congo copal must be described as "Copal Equateur."

EXPORT POOLS

Next there is compulsory pooling of produce to enforce the most effective use of labour, transport, etc., and to ensure a still closer control over the quality and flow of exports than is given by the Offices and Commission.

The Export Pools, or "Groupements," were formed on the initiative of the chief firms concerned, but where some traders did not think it to their interest to join the pool, the Governor-General has given the schemes official backing and made membership obligatory.

Thus ground-nuts may only be sold through a Pool managed by the Syndicat d'Initiative des Exportateurs du Lomami-Kasaï.

There is also a Rubber Export Pool, and a Cotton Pool organised by the Léopoldville Cotton Growers' Committee.

Analogy with Export Groups in England

Like the Export Groups in England, these Pools are viewed in some circles not merely as a wartime expedient to economise labour and transport temporarily while the national interest imperatively demands it, but as the embryo of a new, rational system of post-war overseas trade.

Monsieur Jennen, Economic Adviser to the Belgian Ministry of the Colonies, has had the courage to pronounce unequivocally in their favour, and hopes to see pools for all Congo produce, which would organise all sales abroad, the producer having nothing more to do than produce of his best and deliver to the Pool. The Pool would have a standard contract, long-term price agreements, standardized packing, and carefully graded goods. Each Pool would, moreover, have a single selling agency in each buying centre, in place of a number of competing small commission agents each pushing the wares of one company.

It has been suggested that the Pools should also become joint buying agencies, to provide producers with tools and other equipment and supplies obtained in bulk direct from the manufacturers.

CONTROL OF MINING OUTPUT

It is extremely difficult for England and America to spare much plant and to ship it safely to the Congo at present; also, the small supply of skilled supervisors and technicians in the Colony has been depleted by the demands of the Belgian Army.

Consequently there is also some direct control of mining production, to ensure that plant and skilled staff are promptly switched from one industry or mine to another as war developments or local circumstances require. We have already seen that war policy first called for a production drive in the gold mines, but that after the Pacific losses and the full alliance with America, tin suddenly became far more important.

Such turns in the situation will now be swiftly met by exercising the powers of the Direction de la Production Minière de Guerre (War Mining Production Board), commonly known as D.P.M.G.

The Board can transfer engineers to whatever work becomes most urgent for the purposes of war, and can order that plant and machinery be used in common by two or more producers if need be.

Monsieur Liénart, a Provincial Commissioner of the Congo, has been appointed head of the Board, and will be assisted by a technical adviser and secretarial staff. He has authority to call on the services not only of all the technical experts on the Congo Government staff, but also of the employees of private companies and semi-private bodies such as the Upper Congo-Great Lakes Railway, the Katanga Special Committee, and the Kivu National Committee.

Monsieur Liénart has declared that all private interests must take second place; total participation in the war until final victory comes before all else.

LABOUR LEGISLATION

Key Men must Remain at their Posts

A measure similar to the Essential Work Orders in England is the decree of the Governor-General ordering a state of "Civilian Mobilisation." Under this, practically

all expiring contracts of employment will be automatically extended for the duration of the war.

Also for the duration of the war, all male adult able-bodied natives can be compelled to work sixty days a year in growing, harvesting, or gathering war produce, in addition to the sixty days' service on roads or native-owned plantations which may already be required of them under peacetime legislation (decree of 5th December, 1933). Wages are, of course, paid for any compulsory service of this kind.

CONCLUSION: TOTAL WAR

It is fair to conclude from all these facts that the Belgian Congo's organisation for the struggle against Nazism merits the name of total war, all energies and resources in every sphere being directed to the one end of speedy Allied victory.

In the words of the Governor-General in his broadcast on the Belgian National Day this year (1942):

"Since the 10th May 1940, since Germany invaded Belgium, the Congo has done nothing else but make war, and lives only for victory. The Congo makes war both in the field of battle and on the job. In spite of having given the best of our men to the Army, in spite of the gaps made by death, sickness, and necessary leave, we are producing and delivering more successfully than ever all that the Allies ask, whatever can increase their strength, whatever can strike a blow at the enemy.

"In the hour of victory we shall restore to our Sovereign the flag entrusted to us, free, proud, and unsullied."